Portable Device that Helps Stroke, Alzheimer's and Parkinson's Patients Swallow and Cough Safely

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Technology description

Coordinates Proper Movement of Muscles in Neck and Throat Via Electrical Stimulation to Prevent Choking and Aspiration

This noninvasive, portable electronic device treats swallowing and coughing difficulties in patients with impaired airway protection. Impaired airway protection is a common symptom of neurologic and neurodegenerative conditions such as stroke, multiple sclerosis, amyotrophic lateral sclerosis (Lou Gehrig's disease), Alzheimer’ s disease and Parkinson’ s disease. The prevalence of swallowing difficulties (dysphagia) may be as high as 22 percent of the population over 50 years old, but because this disorder cuts across so many diseases, it is often poorly understood and under diagnosed. Dysphasia can lead to dystussia (coughing disorder). The inability to coordinate muscles needed to safely swallow and cough puts these patients at high risk for inhaling food, saliva and nasal secretion into the bronchial tree, sometimes leading to aspiration pneumonia or even death by choking. Between 5 and 10 million people get pneumonia in the United States each year, and 15 percent of those cases are caused by aspiration. The disease is the third most frequent cause of hospitalization, and though the majority of patients respond well to treatment, pneumonia kills 40,000-70,000 each year. Effective strategies to restore swallowing function may decrease deaths caused by aspiration pneumonia or choking. Researchers at the University of Florida have developed a noninvasive, portable device for airway defense that, when attached to the outside of a patient’ s neck, automatically delivers electrical stimulation to improve muscle coordination. The device promises to reduce the incidence of aspiration pneumonia and subsequent morbidity and mortality. A portable device that improves coordination of muscles involved in swallowing and coughing.

Technology

University of Florida researchers have developed a noninvasive device that promotes airway protection in patients who experience swallowing difficulties (dysphagia) and coughing difficulties (dystussia). By coordinating proper movement of muscles in the neck and throat via electrical stimulation, the technology could reduce the incidence of aspiration pneumonia and choking deaths. It monitors muscle contractions via submental electromyogram (EMG) and applies targeted electrical stimulation,

through a proprietary algorithm, delivered to the neck in a way that minimizes impairments in laryngeal elevation. Portable, noninvasive and highly effective, the device can be worn for extended periods of time.

Advantages

Increases muscle coordination in multiple airway behaviors, improving treatment outcomes for patients with impaired airway protection
Device is portable and can be used outside of a physician’ s office, enhancing convenience
Produces long-lasting effects, making this treatment cost-effective and appealing for patients and healthcare providers alike
Uses biofeedback to monitor patient’ s condition, and can be remotely adjusted by physician

Institution

University of Florida

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